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STUDIES ON THE ATLANTIC AMERICAN PIPEFISHES WITH DESCRIPTIONS OF NEW SPECIES

By

Earl S. Herald
Steinhart Aquarium, California Academy of Sciences

The Atlantic American Syngnathid fauna seems to be in the process of evolving many new forms. Some of the divergencies from the parent stock are as yet so slight that a sizable collection of comparative material is often required to distinguish these trends. In part this has been responsible for some of the confusion in the classification within this group. The material herein presented is an attempt to clarify some of the problems.

The descriptions of four new forms in this paper as well as the resurrection of two old names brings the known Atlantic American pipefishes to a total of 29 forms representing 25 species. In the following list, the common names with asterisks appear for the first time. Those without asterisks are from the American Fisheries Society *Checklist of Common and Scientific Names* (second edition, 1960):

Opossum Pipefish	*Oostethus lineatus* (Valenciennes, 1856)
Whitenose Pipefish	*Corythoichthys albirostris* Heckel, 1853
Crested Pipefish	*Corythoichthys brachycephalus* (Poey, 1867)
*Deepwater Pipefish	*Corythoichthys profundus*, new species
Northern Pipefish	*Syngnathus fuscus fuscus* Storer, 1839
*Relict Northern Pipefish	*Syngnathus fuscus affinis* Günther, 1870

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Gulf Pipefish	*Syngnathus scovelli* (Evermann and Kendall, 1895)
Sargassum Pipefish	*Syngnathus pelagicus* Linnaeus, 1758
*Chesapeake Dusky Pipefish	*Syngnathus floridae hubbsi*, new subspecies
Dusky Pipefish	*Syngnathus floridae floridae* (Jordan and Gilbert, 1884)
*Key Dusky Pipefish	*Syngnathus floridae mckayi* (Swain and Meek, 1884)
*Bermuda Dusky Pipefish	*Syngnathus floridae nesiotes* Herald, 1942
*Caribbean Pipefish	*Syngnathus rousseau* Kaup, 1856
*Pivothead Pipefish	*Syngnathus fistulatus* Peters, 1868
Chain Pipefish	*Syngnathus louisianae* Günther, 1870
Bull Pipefish	*Syngnathus springeri* Herald, 1942
*Southern Pipefish	*Syngnathus folletti* Herald, 1942
Shortfin Pipefish	*Syngnathus elucens* Poey, 1867
*Ocellated Pipefish	*Syngnathus randalli*, new species
Pugnose Pipefish	*Syngnathus dunckeri* Metzelaar, 1919
*Dwarf Pipefish	*Syngnathus hildebrandi*, new species
*Freshwater Pipefish	*Pseudophallus mindii* (Meek and Hildebrand, 1923)
*Finless Pipefish	*Penetopteryx nanus* (Rosen, 1911)
*Lost Pipefish	*Ichthyocampus pawneei* Herald, 1950
*Deep-bellied Pipefish	*Leptonotus blainvilleanus* (Eydoux and Gervais, 1837)
Banded Pipefish	*Micrognathus vittatus* (Kaup, 1856)
Fringed Pipefish	*Micrognathus* (*Anarchopterus*) *crinigerus* (Bean and Dressell, 1884)
Insular Pipefish	*Micrognathus* (*Anarchopterus*) *crinitus* (Jenyns, 1842)
*Seahorse Pipefish	*Amphelikturus dendriticus* (Barbour, 1906)

Since the primary purpose of this paper is to describe new forms that will be treated in more detail in a forthcoming volume of the Sears Foundation, *Fishes of the Western North Atlantic*, a key will not be published herein. However, during this interim period, a mimeographed key, modified from Herald, 1942, will be available upon request from the author.

Deepwater Pipefish, *Corythoichthys profundus* Herald, new species.

Holotype. USNM 198096, male 198.5 mm. standard length (204 mm. total length); *Silver Bay* Station 3466: About 90 miles slightly south of due east from Melbourne, Florida (Lat. 27°56′ N.; Long. 79°05′ W.); 100 fathoms; 6-foot tumbler dredge; October 25, 1961.

Diagnosis. Dorsal fin rays 27; pectoral 14–14; anal 3; caudal 10; dorsal

fin covering ½ trunk ring and 5½ tail rings; trunk rings 18; tail rings 38; head 21.8 mm.; snout 12.6 mm.; dorsal fin base 16.0 mm.; pectoral base 2.2 mm.; pectoral length 3.6 mm.; head-in-standard length 9.12; snout-in-head 1.73; dorsal fin-base-in head 1.36; pectoral base-in-pectoral length 1.63; brood pouch covering 20 tail rings; eggs in anterior section only, starting at second tail ring and extending for an additional 9 rings; eggs arranged 1 layer in thickness and maximum of 6 rows in width with an approximate total of 131; brood pouch closure of open type with flaps not meeting in center (see Herald, 1959); brood pouch protecting plates slightly developed. Body ridges of *Corythoichthys* type.

Description. All ridges of head and body strongly accentuated showing minute crenulations when viewed under low-power microscope. Median snout ridge extends over posterior half of snout ending between eyes. Anterior orbital projection accentuated; superior orbital ridge begins above center of eye and extends posteriorly for about one eye diameter. Opercular ridge extends over anterior fourth of opercle; single supra-opercular ridge is half length of opercle. Median head crest trilobed with small additional projection just behind eyes. Pectoral cover plate with both superior and inferior ridges. Color overall light tan with small flecks of black pigment when viewed under scope. Small blackish pigment spots in web between individual rays of caudal fin. Dorsal fin with pigment spots along base of rays and extending out for short distance on individual rays. Pectoral and anal fins colorless.

Discussion. The combination of characters: (a) ring counts, (b) dorsal count, (c) position of dorsal fin, (d) head-in-standard length, and (e) snout-in-head values serve to segregate *Corythoichthys profundus* from all other Atlantic American pipefishes. *Corythoichthys profundus* comes from a greater depth than that at which other pipefishes are found (100 fathoms: 600 feet).

The head of *Corythoichthys profundus* has the typical appearance of the Indo-Pacific group of *Corythoichthys*, all of which have long snouts but lack protective plates along the sides of the brood pouch. *Corythoichthys profundus* does have pouch protecting plates, although only slightly developed. This has been one of the main features used to separate the Atlantic species (subgenus *Corythoichthys*) and the Pacific species (subgenus *Bhanotichthys*), so that now the validity of the subgenera becomes questionable.

Habitat data. The detailed data carefully recorded in the log of *Silver Bay* (Station 3466) show that the type of *Corythoichthys profundus* was taken in a 55-minute drag over coral and sand bottom. During this time the 6-foot tumbler dredge traveled a distance of about 4 knots all on a flat bottom of 100 fathom depth. Surface water temperature was 78° F.; bottom temperature was not recorded; and air temperature was 75° F. Fifteen pounds of material was found in the dredge, of which two pounds was inert calcareous bottom material and 13 pounds consisted of animals of 17 kinds: 5 crinoids, 15 sand dollars, 100 miscel-

laneous crabs, 50 hermit crabs, 5 *Sconsia* sp., 2 *Fusinus* sp., 25 *Murex calliati*, 1 cat-shark egg case, 7 *Kathetostoma cubana*, 1 wrasse, 2 *Antigonia capros*, 3 *Trichopsetta ventralis*, 3 *Achirus inscriptus*, 10 *Syacium* sp., 15 other flatfish, 1 *Prionodes phoebe*, and 1 pipefish (the type described above).

Dwarf Pipefish, *Syngnathus hildebrandi* Herald, new species.

Syngnathus elucens Longley and Hildebrand, 1941, Carnegie Inst. Wash., Tortugas Lab., vol. 34, pp. 61 (holotype doubtfully identified as *S. elucens*).

Holotype. USNM 117251, female 86.5 mm. standard length; Tortugas, Florida; W. H. Longley.

Paratypes. USNM 73235, female 72.5 mm.; *Fish Hawk* Station 7165; Pepperfish Key, SW. Florida (Lat. 29°13.25′ N.; Long. 83°32.5′ W.); 7¼ fathoms, rocky bottom; oyster dredge; November 21, 1901.

USNM 73239, two females 61.5 and 52.5 mm.; *Fish Hawk* Station 7216: St. Martin's Reef, West Florida (Lat. 28°26.5′ N.; Long. 83°08′ W.); 10 fathoms, sandy–grassy bottom; oyster dredge; January 15, 1902.

USNM 109826, female approximately 67 mm. (tail broken); *Fish Hawk* Station 7217: St. Martin's Reef, West Florida (Lat. 28°27′ N.; Long. 83°13′ W.); 11 fathoms, rocky–sandy bottom; oyster dredge; January 15, 1902.

USNM 134312, female 59 mm.; *Fish Hawk* Station 7220: St. Martin's Reef, West Florida (Lat. 28°34′30″ N.; Long. 83°15′45″ W.); 7½ fathoms; oyster dredge; January 15, 1902.

Diagnosis. Dorsal fin rays 19–21; pectoral 10–12; anal 2; caudal 10; dorsal fin covering 0 to ½ trunk ring and 4½ to 5 tail rings; trunk rings 17; tail rings 33–34; head-in-standard length 9.5–10.7; snout-in-head 2.53–2.87; dorsal base-in-head 0.97–1.22; length of brood pouch unknown; color light tan; cirri sometimes present on head and body; very similar in appearance to *Syngnathus dunckeri*. Body ridges typical for genus *Syngnathus*.

Discussion. *Syngnathus hildebrandi* has a small anal fin which instantly serves to segregate it from *Syngnathus dunckeri*, with which it would otherwise be easily confused. In ring counts it is similar to *Syngnathus elucens*, but its much shorter head will separate it from that species (head-in-standard length 9.5–10.7 for *S. hildebrandi* versus 7.08–8.13 for *S. elucens*). *Syngnathus hildebrandi* also has fewer dorsal fin rays than other Atlantic American pipefishes with the same lateral ridge pattern. It may be noted that there are four additional species with a **different** lateral ridge pattern, *i.e.*, three of *Micrognathus* and one of *Amphelikturus*, that also have low dorsal fin counts in the 16–22 range.

Named *hildebrandi* in honor of the late Dr. Samuel F. Hildebrand who recognized that the holotype was somewhat different from other previously known American pipefishes.

The Floridae Complex

Along the Atlantic coast of North America from Chesapeake Bay to Panama there lives in many shallow areas a grass-inhabiting pipefish which has been variously called *Syngnathus floridae* and *Syngnathus mckayi*. This population complex presents an interesting study in that it must have had a continuous shoreline distribution during earlier geological periods, although the present distribution is discontinuous. In the Caribbean the insular member of this complex is *Syngnathus rousseau*.

One population is now restricted to the region between Chesapeake Bay and Seabrooks Beach, South Carolina. This isolated form has previously been known as *Syngnathus floridae*, but herein is given a new name (*Syngnathus floridae hubbsi*). From South Carolina to Biscayne Bay on the southeast Florida coast there is a break in distribution in which no member of the *floridae* complex is known to occur. At Biscayne Bay the *floridae*-type pipefishes are very different from those of the Chesapeake–South Carolina area. This Biscayne Bay member of the complex (*Syngnathus floridae mckayi*) is found from the Miami area south along the keys to Tortugas. Another population (*Syngnathus f. floridae*) is found along the west coast of Florida from Cape Sable (SW. Florida) to Corpus Christi, Texas. From the coastline distances involved, it would be suspected that the Chesapeake *S. f. hubbsi* and the southern Florida *S. f. mckayi* would be most closely related. Surprisingly, this is not the case, for it is the west Florida to Texas component that shows the closest relationship with *S. f. hubbsi*. This similarity is most striking when pipefishes from the Pensacola to Corpus Christi area are compared with the Chesapeake group. It is suspected that these last two populations were continuous at an earlier time by means of a wide seaway or canal which geologists tell us formerly existed across the north-central section of Florida.

It may be noted that Ginsburg (1937) has shown a similar relationship for the common Atlantic American seahorse, *Hippocampus erectus* (sometimes called *H. hudsonius*), in which the populations north and west of Florida are considered to be the same whereas those found in southern Florida and Cuba are assigned to a separate subspecies.

Between southern Texas and Panama only a few specimens of *S. floridae* are known, undoubtedly because of limited collecting. At Panama records indicate a sizable population which meristically is more closely related to the Florida keys' *S. f. mckayi* than it is to the adjacent *S. f. floridae*. This may be a natural result either of temperature or of ocean current patterns moving through the Cayman Sea northeastward through the Straits of Florida. When more material is available it is probable that the Panamanian population can stand as a separate subspecies, and this is probably also true of the *Syngnathus floridae* group on the west coast of Florida. In fact, the writer at one time had these written up in this manner, but has withheld such until the case is stronger.

In the Caribbean, the inshore weed habitat of *Syngnathus floridae* is taken over by the closely related but less abundant *Syngnathus rousseau*. Specimens of the former have not been collected in grassy habitats within the insular area although the two species have been taken together in Panama. Even in this locality it is not easy to separate them since most of the meristic characters are similar with the exception of the tail ring count (32–34 for *S. rousseau* and 35–37 for *S. floridae*). Were it not for the fact that they have been collected at the same place, they would otherwise have to be considered as mutual subspecies rather than full species. Unfortunately this tail ring separation breaks down in the Caribbean so that the many small floating pipefishes found at sea are often impossible to assign exactly to one species or the other.

Although there is a large *S. floridae* population of dwarf forms in Bermuda (*S. f. nesiotes*), only four *S. floridae* specimens have been collected in the intervening Bahamas. Indications are, however, that some grassy shallow areas in the Bahamas do support a modest *S. floridae* population, for example, Little Bahama Bank. Detailed analyses of the various *S. floridae* groups will be presented later; for the present the Chesapeake Bay population will be recognized under a new name, described as follows:

Chesapeake Dusky Pipefish, *Syngnathus floridae hubbsi* Herald, new subspecies.

Holotype. USNM 91321, gravid male 177 mm. standard length; Lower York River, Virginia; Wm. C. Schroeder, July 8–12, 1921.

Paratypes. USNM 133053, 33 specimens including 6 males and 27 females and subadults (44–172 mm.); same data as holotype.

Other specimens examined. (Total 133, excluding types; mostly in USNM); *Maryland*: Crisfield (4); Plum Point (1); *Virginia*: Cape Charles City (33); Lewisetta (2); Lower Rappahannock River (49); Buckroe Beach (5); Mouth of Hampton Creek (4); Norfolk (3); Cape Henry (1); *North Carolina*: Beaufort (28); Cape Lookout (2); Wilmington (1).

Diagnosis. Dorsal fin rays 27–31; pectoral 14–15; anal 3; caudal 10; dorsal fin covering ½–2 trunk rings and 5–6½ tail rings, usually 1 + 6; trunk rings 16–18, usually 17–18; tail rings 31–34; head-in-standard length 5.2–6.8, usually 5.4–5.9; dorsal-in-head 1.35–1.85, usually 1.45–1.7; snout-in-head 1.6–1.88; brood pouch covering 18–21 tail rings; brood pouch closure of inverted type, *i.e.*, contacting brood pouch folds turning inwardly dorsad; eggs averaging 0.9 mm. in diameter and arranged 1 or 2 layers in depth and 3 or 4 rows in width on each side of pouch; protecting plates of pouch moderately developed; largest female 206 mm.; largest male 180 mm.; smallest sexually mature male 103 mm.; adult females slightly V-bellied.

Discussion and comparison. *Syngnathus floridae hubbsi* has been recognized since 1882 when Jordan and Gilbert stated in their original description of the Pensacola types of *Syngnathus floridae*: "In our paper on the Fishes of Beaufort Harbor (*Proc. U. S. Nat. Mus.*, 1878, 368), we have recorded a '*Siphostoma fuscum*' from that locality. The specimens referred to under that name belong to *Siphostoma louisianae* chiefly; among them are examples of the present species."

Although at the time of his 1942 paper the writer considered the Chesapeake Bay population as distinct from that existing in Florida, Texas, Panama, and Bermuda, it was nevertheless felt that there was reason to suspect that some of the type material of *Syngnathus floridae* from Pensacola had been mixed with males of the Chesapeake form. Consequently the use of names in the 1942 publication is different from that in this paper. The change is due to the additional material which has become available since that time and to the conclusion that the Chesapeake Bay form, although recognized, had never actually been described.

In the region in which *Syngnathus floridae hubbsi* occurs, it can be segregated from the other two species which are present (*S. fuscus* and *S. louisianae*) by the head-in-standard length value (*S. f. hubbsi* 5.4–5.9 vs 6.3–9.5 for others); also by the number of rays in the dorsal fin (*S. f. hubbsi* 28–31 vs 32–41 for others); and by the position of the dorsal fin on trunk and tail (*S. f. hubbsi* usually 1 + 6 vs 3–5 + 4–6 for others). From the members of the *floridae* complex, the mature males of *S. f. hubbsi* can be separated without difficulty on the number of rings covered by the brood pouch (*S. f. hubbsi* 18–21 vs 12–17 for others). Although geographically the females of *S. f. hubbsi* can be segregated from the other subspecies of *S. floridae* on the basis of locality data, there are nevertheless many females of *S. f. hubbsi* which cannot be segregated from the other subspecies of *S. floridae* on meristic characters. This is especially true of the type subspecies, *S. f. floridae*. One who is thoroughly familiar with the two subspecies can sometimes segregate typical females by means of their general appearance, but as yet there are no objective criteria which can be applied despite a considerable amount of time that has been expended on the problem.

Named *hubbsi* in honor of Dr. Carl L. Hubbs whose helpful interest in the *S. floridae* complex has been of considerable aid.

Lectotypes

Since the original descriptions of two of the *S. floridae* complex were based on series material without designation of holotype, it is advisable to select lectotypes as follows:

Syngnathus floridae floridae (Jordan and Gilbert, 1884). *Siphostoma floridae* Jordan and Gilbert, 1884, *Proc. U. S. Nat. Mus.*, vol. 5, p. 263.

Lectotype (herein designated). MCZ 35958, originally from USNM

30826; 148 mm. gravid male with brood pouch covering 17½ tail rings; Pensacola, Florida; Silas Stearns and David Starr Jordan.

Syntypes. USNM 30826, six females 121–155 mm.; same data as lectotype above.

Syngnathus floridae mckayi (Swain and Meek, 1884). *Siphostoma mckayi* Swain and Meek, 1884, *Proc. U. S. Nat. Mus.*, vol. 7, p. 239.

Lectotype (herein designated). SNHM 1894; 138.5 mm. gravid male with brood pouch covering 13 tail rings; Key West, Florida; David Starr Jordan; December, 1884.

Syntypes. SNHM 1894, three females, 170, 178, and 211 mm.; same data as lectotype; USNM 34989, two females, 158 and 163 mm.; same data as lectotype.

Relict Northern Pipefish, *Syngnathus fuscus affinis* Günther, 1870.

Syngnathus affinis Günther, 1870, Cat. Fishes, Brit. Mus., vol. 8, p. 163; holotype 145.5 mm. male from "Louisiana"; Brit. Mus. 1854.7.32.

Other material examined. USNM 132675; 174 mm. male and 117 mm. female from Corpus Christi Pass, Oct. 14, 1926, J. C. Pierson; CNHM 40309; two females, 206 mm. and 218 mm., from Corpus Christi, C. T. Reed.

Diagnosis. Dorsal fin rays 36–39; dorsal covering 4–5 trunk rings and 4–5 tail rings; pectoral 14–16; anal 3; caudal 10; trunk rings 18–19; tail rings 33–36; head-in-standard length 8.55–9.8; snout-in-head 2.06–2.36; females flat-bellied as is characteristic of *Syngnathus fuscus* in the southern portion of the range (South Carolina to Florida). Brood pouch covering 12½ to 15 tail rings.

Discussion. Since the time of the original description of *Syngnathus affinis*, no specimens have been known which could definitely be assigned to this species. At the time of his 1942 paper, the writer thought that the holotype of *S. affinis* was a specimen of *S. fuscus* from an erroneous locality. However the four specimens indicated above demonstrate that there is a relict *S. fuscus* population in the Corpus Christi area. Although the characters of these specimens are slightly different from those of the type of *S. affinis*, their variation is not sufficiently great to prohibit their being assigned to subspecific status under that name. The holotype of *Syngnathus affinis* was re-examined for the writer by the late Mr. V. Tchernavin.

Further study and more material will be needed to determine the relationship of this relict flat-bellied population to the similar flat-bellied group of *S. fuscus* from South Carolina to Florida.

Bull Pipefish, *Syngnathus springeri* Herald, 1942

At the time the writer described this short-nosed, long-trunked cousin of *Syngnathus louisianae*, only four specimens were known. Since then, largely

because of the extensive exploratory work of the U. S. Fish and Wildlife Service ships, *Silver Bay*, *Oregon*, *Pelican*, *Combat*, and *Gill*, a representative group of specimens has become available. It now appears that *Syngnathus springeri* is truly different in habitat from the other American pipefishes. Although moderately abundant, it generally does not occur in the intertidal and other very shallow water, but prefers slightly deeper water from 10 to 70 fathoms, and it may occur as much as 100 miles offshore. In the young stages it may be a floater and be picked up by dipnet under the night light (eight localities) or eaten by tuna (one locality). The species apparently has a higher reproductive potential than most other pipefishes: one male, 274 mm., had 1,390 eggs in the 16½-ring brood pouch. The range, based on the 65 specimens and 48 localities examined either directly by the writer or from data sent to him, now extends from Cape Lookout and Morehead City, North Carolina, to Pensacola, Florida. It occurs in the Bahamas (four localities) where its relative, *Syngnathus louisianae*, does not occur; but it is missing at Bermuda where the latter is found. It has been taken in the same offshore haul with *Syngnathus louisianae* (30 miles south of Pensacola, 70 fathoms), but this latter species, by contrast, is found as well in very shallow water. These two species are the largest in the Atlantic American Syngnathid fauna, with the short-snouted *S. springeri* reaching 355 mm., and the long-snouted *S. louisianae*, 326 mm. *Syngnathus springeri* also has the distinction of having the largest number of trunk rings—23–24, usually 23, as contrasted with the next highest number for *S. louisianae*—19–21, usually 20.

Insular Pipefish, *Micrognathus* (*Anarchopterus*) *crinitus* (Jenyns, 1842).

Pipefishes previously assigned to *Micrognathus* (*Anarchopterus*) *crinigerus* have upon re-analysis been found to represent two species whose appearances are identical, but whose meristic characters allow quick separation on the following data:

	No. Specimens	Dorsal Rays	Pectoral Rays	Trunk Rings	Tail Rings
M. crinitus	28	18–20	10–11	17–18	32–35
M. crinigerus	86	16–18	8–9	14–16	37–39

Micrognathus crinitus has been taken at Tortugas, Florida, and between Vieques and Culebra islands, Puerto Rico; other records are from the Bahamas: Royal Island, New Providence Island, and Little Bahama Bank. Records for five additional Bahaman localities are contained in the collections of the Academy of Natural Sciences of Philadelphia, and will be reported by Dr. James Böhlke. Surprisingly, only one specimen of *Micrognathus crinigerus* has been taken in the Bahamas, and yet it is not an uncommon species along many sections of the Florida coastline from Biscayne Bay southward as well as on the entire west coast of Florida. On the other hand, *Micrognathus crinitus* is strictly

insular in habitat, at least insofar as the Caribbean is concerned. A total of 28 specimens including the type are known (January, 1965).

The late Mr. V. Tchernavin of the British Museum re-examined the type of *Syngnathus crinitus* for the author, and in spite of the fact that it was collected at a considerable distance from the Caribbean, *i.e.*, Bahia Blanca, northern Patagonia, its characters are sufficiently close to those of the North American specimens that the latter can be assigned to *M. crinitus*.

The subgenus *Anarchopterus* of *Micrognathus* has only the two species mentioned above. This subgenus is characterized by smooth body ridges and absence of the anal fin. By contrast, the subgenus *Micrognathus* is characterized by sharp body ridges, and the presence of the anal fin. It has one Atlantic species, *M. vittatus*, and eight species in the Pacific.

Banded Pipefish, *Micrognathus vittatus* (Kaup, 1856) versus
Micrognathus ensenadae (Silvester, 1916).

There are two color variations of the banded pipefish. If these were to be recognized as separate species, the above two names would be applicable. The two forms are not separable on the basis of meristic data; however, some of the writer's colleagues feel that they are separable on ecological data and should thus be accorded specific rank. Hence a re-examination of the approximately 42 known specimens has been made. These specimens came from 25 localities ranging from Bermuda and the Bahamas southward through the Florida keys to Cuba, Jamaica, Haiti, Puerto Rico, Arcas Cay (75 miles off Campeche), Venezuela, and Brazil. Obviously, with this distribution the banded pipefish is primarily insular in habitat. On the basis of color, the specimens available separate into a group of 31 with the *vittatus* pattern and 11 with the *ensenadae* pattern. It is interesting to note that the *ensenadae* pattern is duplicated in the smaller but not closely related *Micrognathus nitidus* of the Pacific.

The typical *vittatus* coloration is usually rather dark, variable, and nondescript; there may be 3–5 dark bands around the trunk and 8–9 around the tail. These bands are more distinct on the upper surface, often fading ventrally. By contrast, the *ensenadae* pattern is quite spectacular with a series of rich brown bands around the head and body. These are about a ring or more in width. The head has a variable mottled pattern with the first distinct band just ahead of the pectoral fins, followed by 6 bands on the trunk and 13–16 on the tail. Between the brown rings is a much lighter color ranging from yellow to off-white. Although the type of *Corythoichthys ensenadae* is lost, Silvester did publish an excellent color plate two years after his original description (Carnegie Inst. Wash., Publ. 252, Dept. Mar. Biol., vol. 12, p. 21, fig. 3, 1918). The type of *Corythoichthys vittatus* Kaup is in good condition at the Paris Museum (no. 602), where it was examined by the writer.

The range in size of the 11 *M. ensenadae* specimens is from 54 mm. to 116 mm., whereas that of the 31 *M. vittatus* specimens is from 52 mm. to 140 mm. Unfortunately, there are no really small specimens, hence the size at which the patterns first appear cannot be determined. Not one of the patterns is truly intermediate between *M. vittatus* and *M. ensenadae* although there is an occasional indication that intermediates might occur in some individuals of *M. vittatus*. *Micrognathus vittatus–ensenadae* appears to be a solitary species, as demonstrated by the collection records, most of which consist of single individuals. In four cases, two specimens were taken at the same time, and from Bermuda there is one collection of five individuals which might, however, be an accumulation of specimens. From Albrolhos Islands, Brazil, there are two specimens, both 92.5 mm., one of which exhibits the *M. ensenadae* pattern and the other the *M. vittatus* pattern. This is the only time that both color patterns were taken at the same site, apparently at the same time. In the Bahamas the two color patterns have been taken at closely adjacent localities.

My colleagues, Drs. James Böhlke and Richard Robins, have postulated that the *M. ensenadae* type is always found in the area of sea fans and gorgonian corals, whereas the *M. vittatus* type is characteristically found in grassy areas.

In summation, *Micrognathus vittatus* and *Micrognathus ensenadae* must be considered as one from the standpoint of anatomy, but from the standpoint of coloration they are definitely two distinct varieties which as yet have no intergrades. More material will be required to make the final determination whether we are dealing with two full species, subspecies or color variants.

While this manuscript was in page proof, a strange new Venezuelan pipefish was received from Dr. John Randall. Fortunately it was possible to add its description to this paper.

Ocellated Pipefish, *Syngnathus randalli*, new species.

Holotype. USNM 198903; female 93.5 mm. standard length (95.3 mm. total length); South side of Isla Venados, about 28 kilometers WSW of Cumaná, Venezuela; mangroves sparse on rocky shore; bottom, *Porites furcata*; depth 1 to 2 feet; visibility 20 ft.; temperature 22.5° C. (72.5° F.); ichthyocide station; January 27, 1965; John E. Randall.

Diagnosis. Dorsal fin rays 24; pectoral 13–14; anal ABSENT; caudal 10; dorsal fin covering ½ trunk ring and 4½ tail rings; trunk rings 17; tail rings 32; snout 3.9 mm.; head 9.4 mm.; trunk 31 mm.; tail 53.1 mm.; dorsal fin base 8.3 mm.; pectoral base 1.3 mm.; pectoral length 1.5 mm.; head-in-standard length 9.84; snout-in-head 2.41; head-in-dorsal fin base 0.88; brood pouch details unknown; lateral trunk ridge of typical *Syngnathus* type, i.e., interrupted at anal ring and not continued with lateral tail ridge; belly slightly

V-shaped. Color brown with regular series of round to oval spots on trunk giving way to band markings on tail.

Description: Median snout ridge smooth, slightly raised, beginning at interorbital area and extending forward, three-quarters length of snout. Superior ocular ridge extends posteriorly from center top of orbit for about one eye diameter. Supraopercular ridge present, in posterior position; midopercular ridge short, equal to one-quarter length of opercle. Pectoral cover plate with single ridge in inferior position. Nuchal ridge slightly raised, trilobed. Body ridges distinct, rounded, not sharp. Intermediate plates between rings fairly large, about equal in plate width to distance between plates.

Color pattern quite startling and from Dr. Randall's Field Notes: "Color when fresh, coarse network of greenish brown, enclosing dark-edged spots of light yellowish gray; posteriorly the ground color is light yellowish gray and the reticulatum gives way to interconnected spots along side and ultimately to discrete bars; upper part of snout light greenish yellow, the lower part reddish brown; cheek area olive brown with [four] dark edged light yellow lines (most of which are diagonal); dorsal fin pale; caudal fin dusky yellow; iris red with spoke-like lines of pale yellow." Some appear to continue outward onto throat (five), behind eye (one), and above eye (one).

With preservation, greens and yellows gradually disappear leaving dark brown ground color punctuated with regularly arranged series of light spots, each bordered by a thin dark line. All seven intermedial plates between each trunk ring covered by individual dark-ringed light spots; one on upper surface, two on each side surface, and two on belly. Center of each trunk ring with additional six spots: one at lateral trunk ridge; one at upper trunk ridge extending onto dorsal surface of trunk, and one at lower trunk ridge extending onto abdomen. This middle series of spots begins coalescing at anal fin area, giving rise on tail to complete dark bands between each ring.

Other specimens. USNM 164831, 2 juveniles, 31.3 and 32 mm. standard length; Haiti; William Beebe. These are referred questionably to *Syngnathus randalli*, but are not paratyped. Although both lack the anal fin and have nearly identical meristic counts when compared with the holotype, the head-in-standard length values are quite different: 9.84 for *Syngnathus randalli* and 7.35–7.45 for the Haitian specimens. In addition, the head profiles of the Haitian and Venezuelan specimens are more dissimilar than would be expected if they were size variables of the same species.

Discussion. *Syngnathus randalli* is best described as a short-nosed cousin of *Syngnathus elucens*, but it also differs from *S. elucens* in that it lacks the anal fin. Absence of the anal is important because the only other Atlantic American pipefish with the same lateral ridge pattern that also lacks the anal

fin is *Syngnathus dunckeri*. However, this latter species has a much shorter snout (snout-in-head 2.5–3.4 for *S. dunckeri* versus 2.41 for *S. randalli*), and also the dorsal fin of *S. dunckeri* covers 6 or 7 rings rather than 5 rings and is located entirely on the tail.

NAMED in honor of Dr. John E. Randall whose extensive underwater ecological studies have made him a leader in the new approach to ichthyology.

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